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Impact of Motivational Interviewing by Social Workers on Service Users - a systematic review

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ABSTRACT

The principles of MI align with social work values explaining its increasing use in practice, although the evidence base appears limited. **Purpose:** This systematic review was undertaken to determine the effectiveness of motivational interviewing, by social workers, on service user outcomes.

Method: A literature search was undertaken between 2007 and 2018. All eligible studies were analysed using the Critical Appraisal Skills Programme (CASP) tool. **Results:** Eleven studies met the inclusion criteria and were included in this review. **Conclusion:** MI has a positive effect on service user experience, but this was not consistent. Training was variable but the evidence suggests that practitioner's need on going training, supervision or coaching whilst providing MI. There was limited research examining the impact of MI on children, which was a limitation of this review. There is a need for more qualitative research to surface views and experience of service users to determine why MI is effective.

INTRODUCTION

Originally developed by Miller and Rollnick (2013) in the 1980s Motivational Interviewing (MI) can be understood to be a model of “collaborative conversation” which enables service users to identify and resolve ambivalence about behavioural change (Miller & Rollnick, 2013, p. 12). The approach was initially used in working with the treatment of alcohol misuse (Hohman, 2016). The use of MI has been extended considerably since the 1980s and is now used in a wider range of problematic behaviours such as drug misuse, diet, exercise, smoking, among others (Burke et al., 2003; Lundahl et al., 2010; Pande et al., 2015). The approach encourages empathy and respect by exploring and identifying service users’ thoughts on their behaviour and at the same time encouraging the use of open-ended questions. The focus in MI is on establishing a client-centred relationship, which discourages styles such as confrontation, directive guidance and criticism (Miller & Rollnick, 2013). There are four processes in MI: engaging, focusing, evoking, and planning (Miller & Rollnick, 2013). Although the MI intervention is normally in this order, MI is also recursive and each process may overlap with another and recur. Miller and Rollnick (2013) make the point there is an underlying ‘spirit’ of MI. This is the style or intent behind the use of MI as a technique. The four key elements of this spirit or way are: partnership, acceptance, compassion, and evocation. MI therefore is more than an intervention. It is conceptually and ethically situated within the tradition of person-centred or client-centred care (Wahab, 2005).

There is an extensive literature on the effectiveness of motivational interviewing (MI) in dealing with alcohol problems and a growing body of evidence for the positive impact of MI in other areas of behavioural change (Forrester et al., 2012). A Cochrane study on alcohol and drug misuse reviewed 59 studies and found that people who received MI reduced their use of substances more than people who did not receive any treatment (Smedslund et al., 2011). Lundahl et al. (2010) undertook a meta-analysis of 119 studies over twenty-five years investigated MI outcomes in comparison to other interventions. MI in these studies was used in substance use (tobacco, alcohol, drugs, and marijuana), health-related behaviours (diet, exercise, safe sex), gambling, and engagement in treatment variables. Results demonstrated MI showed significantly better outcomes for people, though overall effects sizes were often small.

In social work MI is seen as helpful because the values of MI are seen as aligned with traditional social work values of empathy, respect and empowerment (Hohman, 2016). MI has been used both on social work qualifying courses and in social work practice (Forrester et al., 2012). One municipal authority in UK, for example, piloted MI training for its child and family social workers (Forrester et al., 2008). The training programme included Stephen Rollnick, co-author with William Miller of the seminal text *Motivational Interviewing* (Miller & Rollnick, 2013). Evaluation of the workshop indicated some positive effects in simulated practice and many participants reported the training impacted positively on their practice.

There are many models of social work (Higgins, 2017). However, it can be suggested that there are shared themes and approaches among many national social work systems (Hohman, 2016). The international or global definition of social work is commonly accepted in over 100 countries throughout the world. It states:

“Social work is a practice-based profession and an academic discipline that promotes social change and development, social cohesion, and the empowerment and liberation of people. Principles of social justice, human rights, collective responsibility and respect for diversities are central to social work. Underpinned by theories of social work, social sciences, humanities and indigenous knowledges, social work engages people and structures to address life challenges and enhance wellbeing.

The above definition may be amplified at national and/or regional levels” (International Federation of Social Work, 2014).

Themes such as social justice, empowerment, and human rights are dominant in this international definition. These themes are consistent with the 'spirit' of MI and its emphasis on partnership, person-centred approach, acceptance, and change (Milner & Rollnick, 2013). Forrester et al. (2014) summarised the reasons why MI and social work could work well together as:

1. Existence of strong evidence base for MI, especially in alcohol misuse but also across a range of health issues
2. MI seems effective particularly with Black and Minority Ethnic groups
3. MI has a particular focus on resistance in engaging with service users

Working together with social work practice agencies the authors of this study became interested in the frequent use of MI in practice. Although MI is by no means the only intervention, its 'alignment' with social work's values may go some way to explain its dominance in many areas of social work practice. However, reviewing some of the evidence base for the use of MI in social work, some research suggested MI did not produce the positive effects originally expected (Forrester et al., 2012). Indeed, the evidence base for the use of MI in social work seemed limited.

The dissonance between the popularity of MI in social work interventions and the lack of robust evidence to support MI's popularity in social work was the rationale for undertaking a systematic review of the impact of MI in social work.

The two main aims of this systematic review are to:

- Identify and synthesise the practice research literature around the use of motivational interviewing and its impact.
- Identify gaps in the practice research literature in the effective use of motivational interviewing.

Despite the advocacy of MI in social work the relevance and efficacy of MI in this professional field remains in its infancy. Even the champions in UK, for example, acknowledge that at present we can say only that MI may be appropriate in social work (Forrester et al., 2014). The rationale for this study was to identify the gap between the use and popularity of MI in social work and the limited evidence to support the efficacy of MI in this area of clinical practice. This study therefore sought to determine the extent and rigour of existing evidence in this field. Given social work's relationship-based values and the spirit of MI the authors felt that the study should explore how the use of MI intervention affected the relationship between social workers and service users, and how that relationship impacted on outcomes for service users. Therefore, the objectives of this systematic review were to:

- Appraise the existing evidence in practice research literature around the impact of motivational interviewing **on service users' and social workers' engagement**
- Appraise the existing evidence in practice research literature around the impact of motivational interviewing **on service users' outcomes**
- Appraise the existing evidence in practice research literature around the impact of motivational interviewing **on social workers' motivational interviewing skills**
- Appraise the existing evidence in practice research literature around the impact of motivational interviewing **on social workers' confidence in working with service users**

MATERIALS AND METHODS

A systematic literature search was applied. Wider literature was also scoped to identify the most relevant terms in what seems to be a broad spectrum of participants and interventions related to motivational interviewing.

Following an agreement on the final scope of the review, a systematic literature review of studies appraising the existing evidence in practice research literature was devised and conducted. Searches were conducted around the impact of motivational interviewing on service users' outcomes and social workers' engagement, interviewing skills and confidence in working with service users.

Heterogeneity of outcomes and other PICO criteria were assessed.

PICO model

PICO model (population, intervention, control, and outcomes) was used when framing the research question and the inclusion and exclusion criteria.

- **Participants:** Social Workers using motivational interviewing with service users or training in motivational interviewing; Service users subject to motivational interviewing interventions
- **Intervention:** Motivational interviewing interventions; Motivational interviewing training for social workers
- **Control:** No motivational interviewing techniques (when improvement of outcomes are assessed)
- **Outcomes:** impact on service users' and social workers' engagement, impact on service users' outcomes, impact on social workers' motivational interviewing skills impact on social workers' confidence in working with service users

Inclusion & exclusion criteria

Types of studies

To maximise the inclusion of the available evidence around impact of motivational interviewing on service users' outcomes and social workers' engagement, interviewing skills and confidence in working with service users the searches were not limited to a specific study design. Hence, all types of study designs, qualitative, quantitative, and mixed-methods, were included in the review as long as they were focussing on service users (adults and children) being subject to motivational interviewing interventions and /or social workers using motivational interviewing with service users. Both qualitative and quantitative studies were included in our searches such as randomised, cluster-randomised or quasi-randomised controlled trials, cohort studies, before-and-after studies and interrupted time series. Journal articles, books, book chapters, theses as well as conference proceedings were also included in the search, as well as grey literature.

Other criteria

Studies from around the world were included as long as the abstract and the paper were written and available in English.

Studies not reporting on motivational interviewing, its impact on service users' outcomes and social workers' engagement, interviewing skills and confidence in working with service users were excluded.

Studies were further excluded if they included service users who were not subject to motivational interviewing, studies on social workers without any experience of using motivational interviewing with service users or who had not undertaken the training in motivational interviewing.

Analysis

As the heterogeneity was found to be high a narrative synthesis approach was employed, using thematic analysis for categorising data. Narrative synthesis is a commonly used method to synthesise data in the context of a systematic review (Tong et al, 2012; Rodgers et al, 2009), especially as it was anticipated that the review would include appraising mixed methods (qualitative, quantitative and mixed) studies. Thematic analysis provides the means of identifying relevant themes (based on the review question) across large and diverse bodies of research (Popay, 2006).

Literature search

The strategy and keywords are outlined in Appendix 1. Databases were searched from January 2007 to 31st July 2018. Papers written in English language were searched for and included. For all included studies, reference lists were also searched as well as lists of references of other relevant systematic reviews identified whilst running the electronic searches.

The following databases were systematically searched by two independent reviewers: Academic Search Complete (Ebscohost), AMED, ArticleFirst, ASSIA, British Education Index, British Nursing Index, CINAHL, Cochrane Library, Education Research Complete, ERIC, Evidence search.nhs.uk, HMIC, Internurse, MEDLINE, PapersFirst, PsycARTICLES, PsycINFO, PubMed, ScienceDirect, Social Care Online, Social Policy and Practice, Scopus, Web of Science.

Selection of studies

Titles and abstracts were screened for eligibility by two authors. Where authors were unsure whether a study met the inclusion criteria, a full text of the article was obtained to aid decision-making and ultimately a third author was used as an arbiter where uncertainty remained. The full-texts of all articles that appeared eligible for inclusion were retrieved. Study authors were contacted about unclear or missing information.

Data extraction and management

Three reviewers independently appraised each of the included studies using a structured critical appraisal tool the Critical Appraisal Skills Programme (CASP) tool. Critical appraisal forms for mixed methods were tested, such as Mixed Methods Appraisal Tool Version 2011 (MMAT-V 2011) (Pluye et al, 2011) as CASP tools do not include a mixed methods checklist. Both suggested tools were previously standardised, validated and are widely used for systematic review purposes.

Each tool was tested with two full text papers and authors of this paper agreed the CASP tool was the best tool to work with as it fitted the purpose of this review and offered a good selection to cover the types of methodologies used in each of the included studies. Any discrepancies were resolved through discussion between the three authors.

Firstly, we have piloted the CASP and other tools, to decide which one we are going to use on the retrieved articles. Secondly, after choosing the CASP tool, for reasons mentioned above, all three authors have further piloted the chosen CASP tool on three papers (same for everyone) and compared the data that were extracted individually. This was discussed during a subsequent meeting and compare authors' notes and data extracted were compared. Thirdly, papers were split equally between the authors and randomly one paper from Author's 1 batch was chosen to be appraised by Author 2 etc. This was followed, again, by a meeting discussing the data extracted. This approach was chosen as it ensures consistency in data extraction.

Through the critical appraisal of included studies it was found, that some studies had gaps in relation to methodological quality but did include contextually-rich details that contributed to the overall narrative synthesis and helped to answer our research question. CASP assessment was undertaken to ensure transparency in the process and authors made and shared notes about the limitations of poor quality studies explicitly to improve future research.

Risk of bias assessment

Three reviewers independently assessed the risk of bias for all types of research designs using the 'Risk of Bias' tool (Higgins and Green, 2011). Judgements concerning risk of bias for each study were classified using "yes", "no" or "unclear" indicating high, low or unclear risk of bias respectively and discussed by the authoring team during regular meetings in the data extraction phase. The results of the risk of bias assessment were incorporated into the findings (the narratives of the review) and limitations sections.

Assessment of heterogeneity

Homogeneity and heterogeneity was assessed in terms of study population, intervention characteristics and reported outcomes. Substantial methodological, statistical and factual heterogeneity across included studies were detected, therefore, the authors of this paper did not report pooled results but instead used a narrative approach to data synthesis. In an attempt to explore possible clinical or methodological reasons for this variation, the authors grouped studies that were similar in terms of populations, intervention features or methodological features.

Data synthesis

Findings with a high homogeneity index were synthesised narratively. As mentioned above, narrative synthesis is a commonly used method to synthesise data in the context of a systematic review, especially when appraising mixed methods (qualitative, quantitative and mixed) studies.

'Guidance on the Conduct of Narrative Synthesis in Systematic Reviews' (Popay, 2006) was used for the purposes of this review. Firstly, a preliminary synthesis was conducted to develop an initial description of the findings of included records and to organise them so that patterns across records could be identified. This was followed by the iterative approach of a thematic analysis, where multiple ideas and conclusions across a body of literature were categorised into themes (Pope et al, 2007).

Initially, using the search terms (see Appendix 1. Search terms & Appendix 2. Flowchart) and inclusion / exclusion criteria 11 studies were identified. More details on studies identified for this systematic review can be found in Appendix 3. Table 1. Characteristics of included studies & Table 2. Characteristics of excluded studies.

Data extracted from these 11 studies were entered into a table grouped by study design and type of intervention to create a descriptive synthesis (see Appendix 3. Table 1). All included studies used a quantitative design and were of mixed research methods and although the main focus of some of those was not on effectiveness of motivational interviewing, all included studies have been presenting and or discussing widely on this subject. Therefore, these were included in our review and can be found in the reference list in bold.

FINDINGS

Critical appraisal

The search identified 95 studies that underwent full text review and following this 78 studies were rejected leaving 17 studies that were assessed by critical appraisal. This resulted in 11 studies being identified for inclusion in this systematic review (ref flow diagram). It is important to note that in three of the studies MI was one of a number of behavioural interventions that were included.

A descriptive analysis of the included studies can be found in Table 1. Six of the papers were published in the USA, two in the UK and one each in the Netherlands, Denmark and Sweden. All of

the studies used a quantitative methodology. The critical appraisal of the papers is presented by topic area to enhance the clarity of the findings.

Alcohol and substance misuse

Three papers focused on alcohol misuse; relating to binge drinking in young women (Palm et al, 2016) or patients with alcohol related health problems (Bager et al, 2010; Kuerbis et al, 2018). Palm et al (2016) compared the use of motivational interviewing with a control group in young women who engaged in risk drinking behaviour and attended a youth health centre. Attrition rates in this study were high at 12 months were only 54% of women attended follow-up, which may reflect selection bias, although the rate of attrition was equal in both the intervention and the control groups.

Bager et al (2010) hypothesized that using MI as an intervention would increase the rate of alcohol abstinence at a two-month follow-up. MI did increase the post discharge abstinence rate at two months when compared to the control group who received normal care; attrition rates were low at 92 per cent and 88 per cent respectively. There was a risk of information bias in this study because patient alcohol use was self-reported. The research team were however confident that this was a true pattern of alcohol consumption because blood samples taken from the first 14 patients correlated with reported drinking behaviour. However, Kuerbis et al (2018) hypothesized that MI would be a stronger predictor of reduced alcohol consumption compared with spirit only MI and that both forms of MI would result in a reduction in drinking behaviour compared with a non-therapy group. This study combined the data from two previously conducted RCT's conducted by the authors in 2012 and 2017 respectively. A limitation of this approach was that there were small differences in procedures between the two studies, although the authors assessed that these were negligible.

Mental health problems and substance misuse

Two studies explored a range of therapies including MI with the aim of reducing mental health problems and substance usage (Slesnick et al, 2013) or to increase patient's motivation to change their pattern of substance misuse (Tibber, et. al, 2015). Slesnick et al (2013) compared three different psychotherapy interventions and found that all three interventions led to clinical improvement over a two-year period. Adherence to follow up at two years was good with between 68 per cent and 82 per cent of participants involved (Slesnick et al, 2013). Tibber et. al. (2015) used a dual intervention including group MI and cognitive behavioural therapy (CBT) over a period of ten (stage 1) and sixteen weeks (stage 2) respectively. Attrition levels at stage 1 were high at 46 per cent and 29 per cent at stage 2.

Another study included in this review also used MI alongside a number of other behavioural interventions. Pande et al (2015) undertook a retrospective observational study to compare participants who engaged in up to seven weeks of an eight-week behavioural health intervention with participants who only completed two weeks of this intervention. They hypothesized that patients who experienced a recent cardiac event who successfully engaged in a behavioural intervention would need less access to health care resources for mental health issues, which would reduce health care costs. Follow up revealed good adherence with between 75 and 80 per cent of participants taking part.

Impact of MI on suicide ideation

A small study conducted by Britton et al (2012) aimed to test the acceptability of MI in veterans in an acute psychiatric unit on suicide ideation. This was a prospective study that was severely limited by the lack of a control group. In addition, bias may have influenced the findings, as the clinician who completed the intervention was the primary clinician as well as a contributor to the rating of the coding system. Eleven of the thirteen participants completed the follow-up assessment, an adherence level of 85 per cent.

Adherence to treatment in patients with long-term conditions

Two studies used MI in patients with long-term conditions to enhance adherence to engagement with treatment regimes in dialysis patients (Russell et al, 2011) and adherence to exercise sessions in individuals with advanced multiple sclerosis (Smith et al, 2012). In both studies the small sample size and the lack of statistical power may have limited the ability to detect a difference.

Working with children, young people and families

The final two randomized clinical trials involved working with children, young people and their parents. Vos et al (2011) evaluated a family based behavioural lifestyle intervention on obesity markers and physical fitness levels and compared this with standard care. The intervention included individual and group sessions with the children and parents and one meeting with the parent and child. Participants were followed up at three months and two years. A limitation of this study was that children were referred to it and therefore there may have been selection or referral bias, therefore the children may not have been representative of severely obese children in the general population.

Forrester et al (2018) hypothesized that training social workers in MI would improve their skills and thereby increase parental engagement and family outcomes. Families were randomised to receive interventions from social workers trained in MI compared with social workers that were not trained in MI. Families were excluded who received less than three visits from the social worker. Whilst 256 families participated in this study, these families may be different to other families who did not participate in the study resulting in recruitment/selection bias in the families recruited.

Main / common themes

The two main aims of this systematic review were to:

- Identify and synthesise the practice research literature around the use of motivational interviewing and its impact.
- Identify gaps in the practice research literature in the effective use of motivational interviewing.

The findings addressing our aims are summarized in the following way: We set out to appraise the existing evidence in practice research literature around the impact of motivational interviewing on service users' and social workers' engagement. Common themes addressed in the selected papers have summarised these under the heading of *Perceptions of service users* and *Perceptions of social workers and/or other professionals delivering the intervention* describing how service users and professionals feel about and engage with motivational interviewing.

We were also interested in impact of motivational interviewing on service users' self-reported outcomes. Common themes addressing this are under the following headings: *Decrease in binge drinking / increase in abstinence; Fatigue, fitness, mood & adherence; Depression and suicidal thoughts; Knowledge and communication* and *Service users' motivation*.

In terms of impact of motivational interviewing on social workers' motivational interviewing skills and social workers' confidence in working with service users; we cannot report much as the papers did not cover this area sufficiently. This might be an area of future focus on another systematic review.

1. How is motivational interviewing (MI) perceived?

1.1. *Perceptions of service users*

Participants in the appraised studies included people suffering from Multiple Sclerosis (Smith et al 2012), suicidal ideation (Britton 2012), alcoholism and binge drinking (Kuerbis et al, 2018; Bager et al 2010; Palm et al, 2016), substance misuse (Tibber et al, 2015; Slesnick et al, 2013), patients on haemodialysis (Russell et al 2011), obesity (Vos et al 2011), cardiac patients (Pande et al, 2015) and issues with parental engagement (Forester et al, 2018). In general authors report participants found MI to be acceptable and helpful to work with.

Britton et al. (2012) reported high follow-up numbers (85%) in his study. This suggests that a large number of participants felt comfortable with MI. This is corroborated by the following statement:

“comfortable and able to talk freely and found the sessions insightful and helpful”. [pp968]

Britton et al. (2012) also reported an overall positive experience contributing towards creating an empathic, collaborative and supportive therapeutic relationship. Russell et al (2011) reported participants perceptions of MI intervention as ‘highly favourable’ and fostering good relationships.

In addition, Smith et al. (2012) reported that MI sessions were significantly longer than control group sessions, and highly appreciated by the participants. The same author reported that the MI intervention group reported feeling less exertion, and physical fatigue and more positive effect overall as well as enjoyment of offered sessions and lower mental fatigue, although this was not confirmed as statistically significant (Smith et al 2012).

1.2. *Perceptions of social workers and/or other professionals delivering the intervention (includes, nurses, dialysis staff, psychologists)*

A wide range of professionals participating in included studies in this systematic review; each study involved social workers but most also included other practitioners to deliver MI sessions ranging from nurses, midwives, dieticians, psychologists and doctors. Authors of all included papers reported on the training and coaching offered to staff and practitioners, in order to deliver the MI intervention effectively (Bager et al, 2010; Britton 2012; Forester et al, 2018; Kuerbis et al, 2018; Palm et al, 2016; Pande et al, 2015; Russell et al 2011; Slesnick et al, 2013; Smith et al 2012; Tibber et al, 2015; Tibber et al, 2015; Vos et al, 2011).

Furthermore, Russell et al (2011) reported that the use of dialysis staff to deliver the intervention was effective, although variations were found in staff personalities which influenced the way the intervention was being delivered (Russell et al, 2011). The same author reported a systematized training and coaching support, however this did not fully account for the intra-individual variation in approach when delivering the interventions.

In some of the included papers the amount of training offered was very explicitly stated. For example, by Palm et al. (2016) reported that practitioners received 30 hours of training in MI as well as feedback from supervisors on 1-2 of their audiotaped MI sessions. In some papers it was only stated that training and support was offered. In another study (Forester et al, 2018), despite the training provided to staff in both the intervention group and comparison group, there was a statistically significant difference in MI skills of staff delivering MI to the intervention group reported.

2. Improvements reported by service users on health-related benefits

2.1. *Depression and suicidal thoughts*

Britton et al (2012) tested MI in veterans in an acute psychiatric unit with suicide ideation. He reported that using MI reduced suicide risk in this population. Follow-up has also revealed large reductions in the severity of suicide ideation in 88% of the participants who completed the

treatment (Britton et al, 2012). Britton's findings (2012) suggest that MI has a potential to reduce risk of suicide in hospitalised veterans with a psychiatric diagnosis.

MI was used by other authors to reduce mental health problems and substance use/misuse. Pande et al. (2015) found that participants in the intervention group had a significant reduction on severity of all components of the depression, anxiety and stress scale (DASS-21) score (Pande et al, 2015). Furthermore, Pande et al. (2015) have reported that the 8-week long intervention was significantly associated with cost savings, driven by an adjusted 48% reduction in total inpatient days and a 31% reduction in all-cause hospital admissions in the 6-month follow-up period (Pande et al, 2015).

From three papers focused on alcohol misuse, binge drinking in young women (Palm et al, 2016) and patients with alcohol related health problems (Bager et al, 2010; Kuerbis et al, 2018), only Kuerbis et al. (2018) have reported findings around MI affecting depression and/or self-efficacy and related self-confidence. Kuerbis et al. (2018) has shown that the level of depressive symptoms has decreased with therapy and reduced drinking. He also reported that depression had a mediating effect on confidence. One of MI's relational components was shown to be important in increasing self-efficacy, which might have prompted reduced drinking in individuals with more than mild depressive symptoms, as their self-efficacy and therefore confidence increased (Kuerbis et al. 2018).

2.2. Decrease in binge drinking / increase in abstinence

From the papers focussing on alcohol and/or binge drinking related problems Palm et al. (2016) has reported a decrease in binge drinking (Palm et al, 2016) in both groups, in addition he has reported a reduction of 30% high risk drinking in the intervention group but 41% in the control group (Palm et al, 2016). Moreover, the same author reported that participants who did not have risk of alcohol drinking at the baseline, about 20% in both the intervention and the control group, had developed risk drinking by the 12-month follow-up (Palm et al, 2016). This will be discussed in more detail in the discussion section of this paper.

In addition to the findings by Kuerbis et. al (2018), Bager et al (2010) reported that MI increased the post discharge alcohol abstinence at two months (Bager et al, 2010), moreover, the statistical analysis reported 75% abstinence in the intervention group and 25% in the control group. There was no difference reported between the participants and the health professionals' estimates of the motivation for abstinence, as reported by the authors and the patients drinking status at follow-up (50%). About half of the participants assessed at follow-up were drinking and 80% of the total population sample for this study had failed to be in contact with the public alcoholism centres (Bager et al, 2010) after the study ended.

2.3. Fatigue, fitness, mood & adherence

As mentioned before Russell et al (2011) and Smith et al. (2012) used MI in patients with long term conditions to enhance adherence to engagement with treatment regimes in dialysis patients (Russell et al, 2011) and adherence to exercise sessions in individuals with advanced multiple sclerosis (Smith et al, 2012). In both studies MI was found to have a positive impact on adherence (Russell et al, 2011; Smith et al, 2012). For dialysis patients MI influenced attendance for treatment which consequently improved biochemical markers of the haemodialytic patients (Russell et al, 2011). These findings may be directly linked to the good levels of adherence reported by the same authors.

Smith et al (2012) identified that five out of six main outcomes favoured MI when compared with health coaching. Five out of six outcomes were reported to have improved and three out of these five improved at statistically significant levels. These were better exercise experience, self-reported lower levels of exertion and physical fatigue (Smith et al, 2012). Smith et al. (2012), however, has reported no difference in attendance of the sessions between both groups. He mentions that MI sessions were significantly longer than control group sessions (Smith et al, 2012). In addition the MI group reporting less exertion, and physical fatigue, a more positive effect overall and lower mental

fatigue and higher enjoyment, although these outcomes were not statistically significant (Smith et al, 2012).

Vos et al. (2011) has reported that the multi-component intervention, including MI, improved BMI measurements (by 10%), reduced waist circumference (by 19%) and several other health and fitness related benefits (e.g. a decrease in blood pressure, body weight and a change in nutritional habits) reported in the intervention group compared to control group. Physical fitness was also shown to have significantly improved in the intervention group as well as coping strategies (Vos et al. 2011). A positive 1-year follow-up treatment effect was reported by Vos et al (2011) for adiposity, physical fitness and glucose homeostasis. A significant long-term treatment effect on adiposity was also reported, although almost all children remained obese (Vos et al, 2011).

3. Improvements reported by service users in knowledge and communication

Several of the authors (Vos et al. 2011; Slesnick et al 2013 Tibber et al, 2015) reported improvements in service users' knowledge and/or communication with practitioners, staff and family members.

Knowledge increase (no shift in attitudes though), as a result of the intervention, was reported by Tibber et al. (2015). In addition to increased knowledge of participants Tibber et al (2015) reported Improved grasp of reality, in terms of a more realistic evaluation of the challenges facing the participants if patterns of thoughts and behaviours are to be changed (Tibber et al, 2015). Substantial increase in external motivation for treatment was also reported (Tibber et al, 2015).

Both treatments (MI and family system therapy), focussing on improving communication with a view to decreasing problem behaviours in runaway adolescents, researched by Slesnick et al (2013), were associated with a significant reduction in internalizing and externalizing behaviours at the 2 year follow-up. MI was reported to having produced a faster rate of change compared to family systems therapy (Slesnick et al 2013).

4. Improvements reported by service users in motivation

Several authors have reported that MI improved or prompted the service user to seek more therapies to deal with their problems.

Britton et al. (2012) reported that in the follow-up, 73% of participants completed two or more mental health or substance abuse treatment sessions each month (Britton et al, 2012).

In addition to that, the MI intervention has been reported to have influenced dialysis attendance and shortened treatments as patients' biomarkers improved (Russell et al, 2011). Smith et al. (2012) found MI to have a positive impact on adherence.

Improvement in motivation has already been reported (above) to correlate with improved adherence and attendance at intervention sessions. Improved motivation and adherence rates in groups receiving MI intervention suggest further importance of MI and its components. This possible link will be explored in more detail in the discussion. Increase in internal motivation for treatment has been also reported by Tibber et al. (2015).

DISCUSSION

This paper adopted a systematic approach to a review and synthesis of a range of literature, which explored the impact on service users of motivational interviewing in social work. We identified four themes encapsulating the impact of motivational interviewing in social work interventions: **how is MI perceived by service users, working with MI for SW and/or other staff delivering the intervention; improvements reported by service users on health-related benefits; Improvements**

reported by service users in knowledge and communication; improvements reported by service users in motivation. This review provides some evidence that motivational interviewing can have a positive impact in some areas. However, there are limitations that are explored in this discussion.

Service users were positive about the use of MI and their relationship with professionals engaged in MI. The studies demonstrated a widespread use of MI across a range of service users including health (multiple sclerosis, patients on haemodialysis, obesity, cardiac patients), alcohol and substance misuse, and children and families. Of the eleven papers reviewed only three papers (Slesnick et al. 2013; Vos et al. 2011; Forester et al, 2018) focused specifically on parents and/ or children under 18. The authors of this review liaised with a leading social work academic, Melanie Hohman (2016). She confirmed that in her experience there is a gap in research on the impact of motivational interviewing in children and family social work, and, in particular, outcomes for children. The limited evidence on motivational interviewing in this group is noted in two of this review's studies (Forrester et al, 2018; Slesnick et al., 2013). All three studies focused on children and families found there was limited evidence of a positive impact in the use of motivational interviewing, but other interventions could have a similar impact (Smedslund et al, 2011).

Only two authors reported on interventions that were exclusively conducted by social workers (Forrester et al, 2018; Smith et al. 2012). Pande et al. 2015 worked with a clinical social worker and a behavioural coach. Some of the studies did not explicitly identify the role of social workers, however, all papers refer to the involvement of social workers in the studies identified. In this review social workers tended to be part of an interprofessional clinical team, which made it difficult to be clear about the distinct role of the social worker in the use of motivational interventions. Similarly, motivational interviewing was used as one of a number of interventions, which at times limited the possibility of assessing the impact of motivational itself as an intervention. For example, one study included a range of behavioural interventions that, in addition to MI, included: Cognitive Behavioural Therapy, Acceptance and Commitment Therapy and mindfulness (Pande et al, 2015). It was difficult to extrapolate the significance of MI within this combination of therapies. However, Smedslund et al., (2011) found in their review that other interventions, treatment as usual, and being assessed and receiving feedback can be as effective as motivational interviewing. Hohman (2016) suggests that MI can be helpfully combined with other therapies in social work. Research suggests that combining MI with other interventions can be effective (Lundahl and Burke 2009). More controversially it could be argued that the lack of a significant difference between outcomes for MI as compared to other therapies may be a result of the 'dodo bird effect' (Lundahl et al, 2010). 2009). The dodo bird effect is the argument that no one intervention model or theory is clearly superior (Prochaska & Norcross, 2007).

At times the results could be ambiguous and also inconsistent with results from other papers. For example, in two papers on alcohol management conflicting findings were found. In Palm et al (2016) there was a reduction in binge drinking in both the intervention and control group but the control group reduction was higher than the intervention group (41% and 30% respectively). In Kuerbis et al. (2018) there were no significant changes in drinking behaviour between the three groups.

MI did not reduce drinking in young women with high risk behaviour (Palm et al, 2016) and there was a decrease in binge drinking (Palm et al, 2016) in both groups. Reduction of 30% high risk drinking was found in the intervention group but 41% in the control group (Palm et al, 2016). Of the participants who did not report risk drinking at baseline, 22% in the intervention group and 20% in the control group, developed risk drinking at 12-month follow-up. (Palm et al, 2016)

The results overall in the study by Kuerbis et. al (2018) showed no significant difference in drinking behaviour between the 3 groups by week 8, which was unexpected. It is postulated that as the participants were confident that they could resist drinking that MI may not have been effective

whereas if they were not confident, change talk would have been expected to show a difference. (Kuerbis et al. 2018)

There were three studies on MI with alcohol misuse (Palm et al., 2016; Bager et al., 2010; Kuerbis et al., 2018). MI was originally developed to work with alcohol misuse (Hohman, 2016). However, the three studies on alcohol misuse in this review showed limited positive results. These were of course only three studies and no overall findings can be made. However, it is noteworthy that the effectiveness of MI was not found in this service user group given the established research on the successful use of MI in alcohol misuse (Holman, 2016).

There was no significant difference in family engagement between social workers who undertook MI training and those social workers who did not receive MI training over the 6-month period. (Forester et al, 2018). The authors concluded that the culture of the organisation may be more important than the training package (MI) (Forester et al, 2018).

There have been a number of theories and studies to identify how MI works (Miller and Rose, 2009; Magill et al. 2014; Romano and Peters, 2016; Miller and Moyers, 2016). Miller and Rollnick's (2013) identified two causal hypotheses (relational and technical). The relational hypothesis suggests that a professional/service user relationship based on empathy and MI spirit can evoke client behaviour change. The technical hypothesis suggests that a therapist's directive and skilled use of MI-behaviour will encourage client language in favour of change. It is this change talk that impacts on client outcomes. Findings from some of the studies indicated that the relational hypothesis could be linked to behaviour change (Britton et al., 2012; Tibber et al., 2015; Russell et al., 2011; Smith et al., 2012).

The proficiency of the social workers' skills in MI was at times difficult to estimate because there was limited evidence of the social workers' training and existing level or review of their abilities. Seven studies identified the training of the professionals involved. Given the variety of professionals involved in the interventions and the lack of clarity in some papers of the extent of the social work input it could be that the training that social workers and other professionals received may have affected the efficacy of the impact on service users. One study of four meta-analyses suggested that the professional background and level of qualifications of clinicians was not a significant factor on the success of interventions (Lundahl et al, 2010). Milner and Rollnick (2013, p. 380) reviewed some of the research on motivational interviewing and concluded there was "a very high degree of variability in effects across studies, sites, and clinicians". This is confirmed in our studies. Milner and Rollnick (2013) suggest this variability may to some extent be linked to the difference in professional skills. Training in their view needs to consist of much more than a short course and requires extensive training, maintenance and coaching/ongoing support to clinicians. Some studies confirm that short training courses do not impact effectively on services users (Miller & Mount, 2001; Forrester et al, 2008).

In our review there was a wide variety of training ranging from 5 to 40 hours where identified. Many of the studies did provide ongoing support such as supervision and coaching. However, despite the two social worker-led papers undertaking more than a short course training, impact on service users was limited (Forrester et al, 2018; Smith et al. 2012). Despite the variety and length of MI training there is limited evidence that the most common training model (professional workshops) produces durable changes in therapists and service users (Lundahl et al., 2010). The studies on training efficacy have produced mixed results. Some findings indicate no difference between MI trained and non MI trained counsellors (Miller and Mount, 2001; Chossis et al., 2007). Others identified significant differences between MI trained and non MI trained professionals (Miller et al., 2004; Brug et al., 2007). However, there is evidence that MI dose may improve outcomes (Lundahl et al., 2010). One meta analysis (Burke et al., 2003) identified that the treatment dose accounted for about a quarter of the variance in outcomes. However, typically, MI is seen as a brief intervention and has fewer sessions than comparable therapies, averaging about 100 minutes less face-to-face time in

comparison with treatment as usual programmes (Lundahl, 2010). This means MI is likely to be cheaper. Increasing dosage of MI may have implications when resources and money are restricted.

LIMITATIONS

To the best of our knowledge, this paper is the only systematic review of the international literature on the impact on service users of motivational interviewing in social work. All papers reviewed were quantitative. However, the inclusion of some qualitative studies could have contributed to a greater focus on the voice of the service user. The major limitation of this review is the generalisability of the findings. Primary studies were of varying quality and made use of heterogeneous measures for independent and dependent variables. Generalisability to other international contexts is limited by the primary research studies, which were predominantly undertaken in the USA (6) with limited papers from other countries all of which were European: Sweden (1), UK (2) Denmark (1), Netherlands (1). Despite some similarities between the social work systems of the European countries in our paper there are differences. The relevance of the local context of social work in different countries is a common theme in the literature (Higgins, 2016). Even in the USA, for example, there is no single child welfare system (Duerr Berrick, J., 2011). One of the papers in the review made a similar point. The authors concluded that the culture of the organisation may be more important than the training package (Forester et al, 2018).

Other factors that limited generalisability included: small sample sizes; results not applicable to other parts of the country; convenience samples; study participants not blinded. For example, the results of a Swedish study may not be generalizable across the country because the level of secondary education and the number of foreign background participants was dissimilar to Sweden as a whole (Palm et al, 2016). Using convenience samples meant that the findings were not generalizable to the general population (Slesnick et al 2013). The adolescents and families who participated in a study may have been more motivated to change than those who refused (Slesnick et al 2013). In one paper the two groups could not be blinded to the participants or the staff. Therefore, it was difficult to determine whether it was the contact as opposed to the counselling that resulted in the differences found (Bager et al, 2010). Use of a single centre limits generalizability (Russell et al, 2011). There may be selection bias in that those who agreed to participate may have been different to those who did not. The possibility of the Hawthorne effect could have affected some participants who may have spontaneously altered their behaviour to please the researchers (Russell et al, 2011). Participants referred to a study may have been subject to selection and referral bias: therefore the children may not be representative of severely obese children in the general population (Vos et al. 2011)

Implications for social work practice

MI as an approach can be understood to be a 'good fit' (Wahab, 2005; Forrester et al, 2012) with social work in terms of the underlying values and aims of the profession (Hohman, 2016). Empowering service users and helping them to build on their own abilities and develop their potential is consistent with the theoretical structure and values of MI. This review supports current views that MI can have a positive impact on service users. Social workers must be equipped with sufficient training and ongoing support when delivering MI in practice. Social workers will need more than a 2-day training course, which links to a previously mentioned point in relation to the intervention duration for participants.

As reported above, interventions lasting for longer seemed to have more effect, as reported by authors of the included papers. It may therefore be important to focus on longer-term sustained support and longer lasting interventions for both staff delivering the MI interventions as well as the participants receiving them. Examples of support given to staff could include structured coaching

sessions as well as inbuilt supervision and of course feedback from the participants on MI intervention and the way it is being delivered.

MI may not necessarily be the only relevant intervention. Social workers may find it helpful to explore whether MI could be helpfully combined with other therapies. Whether, when using MI on its own or in combination with other interventions, social workers need to have a clear rationale for their choice(s) of therapies. Finally, it is important that social workers consider the context of their organisations and whether MI is a 'good fit' with the organisational and wider context of their practice.

Research recommendations

The objectives of this review were to appraise the evidence on the impact of MI on: service users' and social workers' engagement; service users' outcomes; and social workers' MI skills. There was some evidence to support the positive impact of MI in social work (impact on service users' and social workers' engagement: service users' outcomes). However, the lack of generalisability and heterogeneity of the studies in the review indicate that further research is required. First, studies are needed on what sort of MI training package is required for social workers to intervene effectively (impact on social workers' MI skills). Social workers need more than a 2-day training course (impact on social workers' MI skills). However, what else they need requires further examination (Forrester et al, 2008). Second, more research is needed that is social work-led and focused on social work practice (impact on service users' and social workers' engagement). Third, more studies focused on the impact of MI in children and families was clearly identified in the lack of studies in this area in our review (Hohman, 2012). Fourth, the influence of clinical and non-clinical settings (Rubak et al, 2005; Forrester et al, 2018) requires exploration. Fifth, the use of interprofessional clinical teams needs exploring in terms of the role and relevance of social work within this type of approach (Forrester et al, 2018). Sixth, there is a wide range of quantitative studies on whether MI works. What is needed now is more research on how MI works (Smedslund et al, 2011). Finally, there is a need for further qualitative as well as large-scale quantitative studies. This review included only quantitative studies. The rationale for developing qualitative studies is that the voice of service users is at the heart of social work. In the spirit of both MI and social work more research is needed that prioritises the views of service users.

CONCLUSIONS

The two main aims of this systematic review were to: Identify and synthesise the practice research literature around the use of motivational interviewing and its impact and to identify gaps in the practice research literature in the effective use of motivational interviewing.

There are three main conclusions to this review. First, there is some evidence that MI impacts positively on service users. Second, there is some limited evidence that extensive training of practitioners can enhance the impact of MI on service users. Finally, the internal limitations of each of the studies preclude generalisability. Due to the limited number of studies that focus on social work practice alone, further research is required focusing on the use of MI in social workers' interventions with service users to determine the impact of MI in social work practice. The limited evidence for the positive impact of MI in social work should not be viewed as a reason to dismiss its positive contribution to social work practice. Like other similar professions, social work is situated within a complex and challenging context, which inevitably impacts on practice. Further research can help social workers develop a more critical and evidence-based approach to the use of MI in social work practice.

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APENDICES

Appendix 1. Search terms & search strategy

Appendix 2. Flowchart

Appendix 3. Tables

- Table 1. Characteristics of included studies
- Table 2. Characteristics of excluded studies

Appendix 1. Search terms

Systematic review searches:

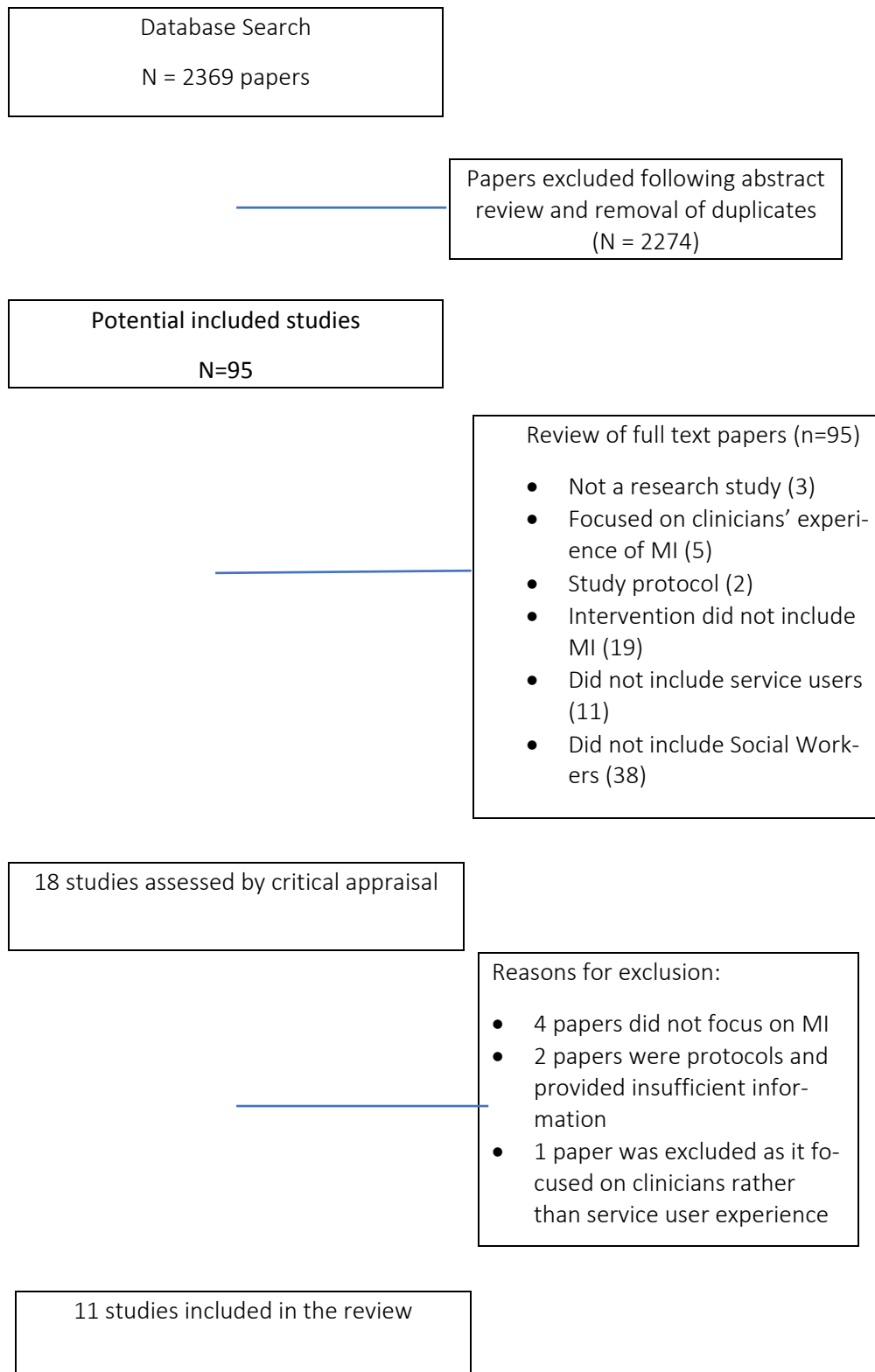
Source	Search	Results
Academic Search Complete (Ebscohost)	<p>'Advanced Search' Search expressed as – motivational AND interview* / Select a Field (optional) AND / "social work" / Select a Field (optional) AND / "service user" OR patient OR client / Select a Field (optional)</p> <p>Limits – Search modes: Boolean/Phrase Published Date: January 2007 – July 2018 Language: English</p>	115 records
AMED (Allied and Complementary Medicine) (Ebscohost)	<p>'Advanced Search' Search expressed as – motivational AND interview* / Select a Field (optional) AND / "social work" / Select a Field (optional) AND / "service user" OR patient OR client / Select a Field (optional)</p> <p>Limits – Search modes: Boolean/Phrase Published Date: January 2007 – July 2018 Language: English</p>	0 records
ArticleFirst	<p>'Advanced Search' Search expressed as – Search for: motivational AND interview* / Keyword and / "social work" / Keyword and / "service user" OR patient OR client / Keyword</p> <p>Limits – Limit to Year 2007-2018 Language: English</p>	0 records
ASSIA (Applied Social Sciences Index and Abstracts)	<p>'Advanced Search' Search expressed as – motivational AND interview* / in Anywhere AND "social work" / in Anywhere AND "service user" OR patient OR client / in Anywhere</p> <p>Limits – Change the 'Publication date' option from 'All dates' to 'Specific date range...' and set to: Start 1 January 2007 End July 2018 Language: English</p>	474 records
British Education Index (Ebscohost)	<p>'Advanced Search' Search expressed as – motivational AND interview* / Select a Field (optional) AND / "social work" / Select a Field (optional) AND / "service user" OR patient OR client / Select a Field (optional)</p> <p>Limits – Search modes: Boolean/Phrase Publication Dates: January 2007 – July 2018 Language: English</p>	0 records

British Nursing Index	<p>'Advanced Search' Search expressed as – motivational AND interview / in All fields + text AND / "social work" / in All fields + text AND / "service user" OR patient OR client / in All fields + text</p> <p>Limits – Change the 'Publication date' option from 'All dates' to 'Specific date range...' and set to: Start 1 January 2007 End July 2018 Language: English</p>	142 records
CINAHL (Ebscohost)	<p>'Advanced Search' Search expressed as – motivational AND interview* / Select a Field (optional) AND / "social work" / Select a Field (optional) AND / "service user" OR patient OR client / Select a Field (optional)</p> <p>Limits – Search modes: Boolean/Phrase Published Date: January 2007 – July 2018 Language: English</p>	22 records
Cochrane Library	<p>'Advanced Search' Search expressed as – Title, Abstract , Keywords / motivational AND interview* AND "social work" AND ("service user" OR patient OR client)</p> <p>Limits – Select 'Search Limits': Database: All; Dates: Between 2007 and 2018 and select 'Apply'</p>	4 records
Education Research Complete (Ebscohost)	<p>'Advanced Search' Search expressed as – motivational AND interview* / Select a Field (optional) AND / "social work" / Select a Field (optional) AND / "service user" OR patient OR client / Select a Field (optional)</p> <p>Limits – Search modes: Boolean/Phrase Published Date: January 2007 – July 2018 Language: English</p>	44 records
ERIC (Ebscohost)	<p>'Advanced Search' Search expressed as – motivational AND interview* / Select a Field (optional) AND / "social work" / Select a Field (optional) AND / "service user" OR patient OR client / Select a Field (optional)</p> <p>Limits – Search modes: Boolean/Phrase Date Published: January 2007 – July 2018 Language: English</p>	4 records
Evidence search.nhs.uk	<p>'Evidence search' Search expressed as – motivational AND interview* AND "social work" AND ("service user" OR patient OR client)</p>	305 records

HMIC (Health Management Information Consortium)	<p>'Multi-Field Search' Search expressed as – motivational AND interview* / All Fields AND / "social work" / All Fields AND / "service user" OR patient OR client / All Fields</p> <p>Limits – Publication Year: 2007-2018 Language: English</p>	0 records
Internurse	<p>'Advanced Search' Search expressed as – Anywhere / motivational AND interview* AND "social work" AND ("service user" OR patient OR client)</p> <p>Limits – Custom range: January 2007 To July 2018 Language: English</p>	33 records
MEDLINE (Ebscohost)	<p>'Advanced Search' Search expressed as – motivational AND interview* / Select a Field (optional) AND / "social work" / Select a Field (optional) AND / "service user" OR patient OR client / Select a Field (optional)</p> <p>Limits – Search modes: Boolean/Phrase Date of Publication: January 2007 – July 2018 Language: English</p>	63 records
PapersFirst	<p>'Advanced Search' Search expressed as – Search for: motivational AND interview* / Keyword and / "social work" / Keyword and / "service user" OR patient OR client / Keyword</p> <p>Limits – Year: 2007-2018 Language Phrase: English</p>	0 records
PsycARTICLES (Ebscohost)	<p>'Advanced Search' Search expressed as – motivational AND interview* / Select a Field (optional) AND / "social work" / Select a Field (optional) AND / "service user" OR patient OR client / Select a Field (optional)</p> <p>Limits – Search modes: Boolean/Phrase Published Date: January 2007 – December 2018 Language: English</p>	5 records
PsycINFO (Ebscohost)	<p>'Advanced Search' Search expressed as – motivational AND interview* / Select a Field (optional) AND / "social work" / Select a Field (optional) AND / "service user" OR patient OR client / Select a Field (optional)</p> <p>Limits – Search modes: Boolean/Phrase Published Date: January 2007-December 2018 Language: English</p>	109 records

PubMed	<p>'Advanced' Search expressed as – All Fields / motivational AND interview* AND / All Fields / “social work” AND / All Fields / “service user” OR patient OR client</p> <p>Date of Publication: January 2007 – July 2018</p>	54 records
ScienceDirect	<p>'Advanced search' Search expressed as – motivational AND interview* AND / “social work” / in All Fields AND / “service user” OR patient OR client / in All Fields</p> <p>Limits – 2007 to Present Language: English</p>	1111 records
Scopus	<p>'Document search' Search expressed as – motivational AND interview* AND “social work” AND (“service user” OR patient OR client) / Article title, Abstract, Keywords</p> <p>Limits – Date range (inclusive): Published 2007 to Present Language: English</p>	37 records
Social Care Online	<p>'Standard search' Search expressed as – motivational AND interview* AND “social work” AND (“service user” OR patient OR client)</p> <p>Limits – Date range (inclusive): Published 2007 to Present Language: English</p>	120 records
Social Policy and Practice	<p>'Multi-Field Search' Search expressed as – motivational AND interview* /All, Fields AND / “social work” / All, Fields AND / “service user” OR patient OR client / All, Fields</p> <p>Limits – Publication Year: 2007-2018 Language: English</p>	10 records
Web of Science	<p>'Basic Search' Search expressed as – motivational AND interview* AND “social work” AND (“service user” OR patient OR client) / Topic</p> <p>Limits – Change 'Timespan' from 'All years' to 'From' and set to 2007 to 2018. Language: English</p>	17 records

Appendix 2: Flowchart



Appendix 3: Table 1. Characteristics of Included studies

Author	Aim/Method/Design	Participants	Intervention/measurements/follow up	Data analysis	Results/Findings	Limitations/Notes
Bager et al. 2010 Denmark	<p>Aim: To evaluate the effect of a brief intervention before and after discharge on the frequency of alcohol abstinence two months after discharge and to identify predictors of abstinence.</p> <p>Hypothesis: Alcohol-abuse intervention initiated before and maintained after discharge would increase the rate of alcohol abstinence at the 2 month follow up.</p> <p>Method: Quantitative</p> <p>Design: Randomised Controlled Trial</p> <p>Power analysis at 90% identified 23 patients in each group with 75% abstinence in intervention group and 25% in control group.</p>	<p>Patients admitted to Aarhus University Hospital with alcohol-related health problems.</p> <p>Inclusion criteria: subjects drinking on a daily basis and express motivation for study participation.</p> <p>25 participants in each group.</p> <p>Randomised by using 'closed envelopes' administered by an independent staff member.</p>	<p>Control group: received standard care</p> <p>Intervention group: MI for 2 months compared with a before and after discharge on the frequency of alcohol abstinence 2 months after discharge.</p> <p>Nurses and social workers were trained and experienced in MI.</p> <p>Measurements: Questionnaire similar to the Addiction Severity Index prior to randomisation.</p> <p>VAS to assess level of motivation.</p> <p>Blood samples measured drinking status.</p> <p>Follow up: 2 month follow up visit. 92% completed in the intervention group (n=23) and 88% in the control (n=22).</p>	<p>Chi-Square and Fishers Exact Test to assess the significance of difference in bivariate analysis.</p> <p>Baseline characteristics were assessed using unpaired <i>t</i> test and ANOVA</p>	<p>Results: 17 patients were abstinent for 2 months in the intervention group and 10 in the control group.</p> <p>Outcomes:</p> <p>There was no difference between the patients and the health professionals' estimates of motivation for abstinence. Half the patients were assessed as highly motivated; half of this number was drinking at follow up.</p> <p>Brief intervention based on MI increased the post discharge alcohol abstinence at two months.</p>	<p>Limitation is that the two groups could not be blinded to the participants or the staff. Therefore difficult to determine whether it was the contact as opposed to the counselling that resulted in the differences found.</p> <p>Risk of the Hawthorne effect (placebo) as both groups were asked the same questions.</p> <p>Potential of information bias as alcohol use was self reported. However, as there was no difference in blood sampling and reported usage in the first 14 patients this is unlikely.</p>

Author	Aim/Method/Design	Participants	Intervention/measurements/follow up	Data analysis	Results/Findings	Limitations/Notes
Britton et al. 2012 USA	<p>Aim: To test the acceptability of interviewing to address suicidal ideation (MI-SI) in veterans admitted to a psychiatric unit with suicidal ideation, estimate its pre-post effect size on the severity of suicidal ideation, and examine the rate of treatment engagement after discharge.</p> <p>Method: Quantitative</p> <p>Design: Prospective study</p>	<p>13 veterans were recruited from an acute inpatient unit between February 16 - August 11, 2010</p> <p>Inclusion criteria:</p> <p>(a) Veteran status; (b) 18 years or older; (c) treated on unit; (d) English speaking; (e) able to give informed consent; (f) eligible to receive healthcare at the unit so they could return for follow-up; (g) clinically cleared to participate (e.g., not aggressive or violent); (h) having thoughts of suicide.</p> <p>Exclusion criteria:</p> <p>(a) current psychosis, (b) current mania, (c) dementia.</p>	<p>Intervention: Participants received a screening assessment, baseline assessment, one or two MI-SI sessions, post treatment assessment, and 60-day follow-up assessment.</p> <p>Measurements: The Beck's Scale for Suicidal Ideation (SSI; Beck et al., 1979)</p> <p>Follow-up: Thirteen veterans were enrolled, 70% (n=9) completed both MI-SI sessions and the post treatment assessment, and 85% (n=11) completed the follow-up assessment.</p>	<p>Standard descriptive statistics were used to describe the sample</p> <p>To assess change in the severity of suicidal ideation, pre-post effect sizes were calculated using the standard formula for Cohen's <i>d</i>.</p> <p>Effect sizes were evaluated according to Cohen's guidelines for interpreting them as small (.20-.49), medium (.50-.79), or large ($\geq .80$).</p>	<p>Results: Preliminary findings suggest that MI-SI has the potential to reduce risk for suicide in hospitalised veterans with a psychiatric diagnosis.</p> <p>Participants found MI-SI to be acceptable. They experienced large reductions in the severity of suicidal ideation at post treatment and follow-up. In the 2 months following discharge, 73% of participants completed two or more mental health or substance abuse treatment sessions each month.</p>	<p>Small sample size so unable to generalize the findings.</p> <p>Lack of a control group is a major limitation.</p> <p>The post treatment SSI only assessed the past 48 hours – which may have impacted on the degree of change in suicide ideation.</p> <p>The clinician who developed the intervention was the primary clinician as well as one of the reliability coders – therefore clinician allegiance may have affected the outcomes.</p>

Author	Aim/Method/Design	Participants	Intervention/measurements/follow up	Data analysis	Results/Findings	Limitations/Notes
Forester et al. 2018. UK	<p>Aim: The study hypothesized that training social workers in MI will increase skills in practice and therefore increase parental engagement. A secondary hypothesis is that trained SW will demonstrate increased skills in MI.</p> <p>Method: Quantitative</p> <p>Design: Pragmatic Trial involving a between group comparison of social worker skills, parental engagement, and family outcomes.</p> <p>Randomised undertaken by the research team independent of the LA. Allocation was concealed behind sealed opaque sheets.</p> <p>Families were blind to allocation but SW and researchers were not.</p> <p>Those coding SW skills were blind to group membership</p>	<p>Undertaken in a London Local Authority.</p> <p>48 social workers and 12 line managers</p> <p>256 families.</p> <p>28 received the intervention; 33 were in the control group.</p> <p>Families were randomised to trained SW (n=67) or untrained (n=98).</p> <p>Exclusion criteria:</p> <ol style="list-style-type: none"> 1. Families who received 2 or fewer visits 2. Families allocated to specialist SW teams: hospital, prison, homeless young people or young people without a carer. 3. Management over-rule; due to SW attrition or a family previously allocated to a SW. <p>Some families not included because the SW did not ask; parents</p>	<p>Intervention: Social Workers (SW) received the MI package</p> <p>Control: SW received no training in MI (received at the end of the study).</p> <p>Measurements: Family Interview Questionnaire;</p> <p>Working Alliance Inventory – measuring parental engagement;</p> <p>Goal Attainment Scale;</p> <p>General Health Questionnaire;</p> <p>Life Rating Scale.</p> <p>Follow-up: 60% of intervention group completed the study (n=40); 62% of the control group (n=61)</p>	Bivariate ANOVA, <i>t</i> tests and chi-square analysis.	<p>Between group analysis was undertaken for the families in each group comparing number of children, proportion that were child protection and ethnicity – there was no significant differences.</p> <p>Statistically significant different in MI skills observed in SW in the intervention group.</p> <p>There was no significant difference in family engagement between the two groups (WAI) over the 6 month period.</p> <p>Concluded that the culture of the organisation may be more important than the training package (MI)</p>	<p>Families who did not take part in the study may have been different to those who did (recruitment/selection bias)</p> <p>Social worker attrition may have caused bias – although between group analysis did not identify any differences.</p> <p>Families were excluded who received less than 3 visits and it is possible that MI training may have affected the number of cases or the decision to close cases.</p> <p>Study was undertaken in one LA and may not be generalizable to other authorities.</p>

		not wanting to participate or researchers unable to contact families for follow up				
Author	Aim/Method/Design	Participants	Intervention/measurements/follow up	Data analysis	Results/Findings	Limitations/Notes
Kuerbis et al. 2018. USA	<p>Aim: Hypothesis was that MI would emerge as a stronger predictor of reducing alcohol consumption when compared with Spirit Only MI (SOMI).</p> <p>Also that MI would be a stronger predictor of reduced drinking compared with SOMI when self-efficacy and confidence was low.</p> <p>Secondary analysis to test hypothesis that both MI and SOMI would predict reduction in drinking compared with Non-therapy condition in greater depressive symptoms</p> <p>Method: Quantitative</p> <p>Design: Study combining two previous RCT's to increase power.</p>	<p>228 problem drinkers with an alcohol use disorder diagnosis (AUD) seeking help to reduce drinking</p> <p>Aged 18-75</p> <p>Av weekly consumption of 15-24 standard drinks a week</p> <p>Participants were recruited using digital and print advertising in media in New York City metropolitan region. Eligible if: (1) aged 18 to 75; (2) average weekly consumption of ≥ 15 or 24 standard drinks per week for women and men, respectively, during the prior 8 weeks; and (3) endorsed criteria for a current AUD.</p> <p>Excluded if they: (1) had another substance use</p>	<p>Intervention: Randomly assigned to one of three groups (method not described in the paper)</p> <ol style="list-style-type: none"> MI – 4 sessions of psychotherapy over 7 weeks B. Spirit only MI - SOMI – change talk proscribed – also 4 sessions of psychotherapy C. Non Therapy Condition (NTC) – were encouraged to change on their own. If still drinking by end of wk 7 offered 4 sessions of MI <p>Measurements: Completed Ecological Momentary Assessment;</p> <p>Timeline Follow back Interview – covering period 9 weeks;</p>	<p>Liner models for the dependent variable. Used SAS statistical software.</p> <p>Each moderator was tested independently: severity of baseline drinking; severe Alcohol Use Disorder; baseline self-efficacy to moderate drinking; mean daily confidence to resist heavy drinking; Depression.</p>	<p>Overall there was no significant difference in drinking behaviour between the 3 groups by week 8, which was unexpected. It is postulated that as the participants were confident that they could resist drinking that MI may not have been effective whereas if they were not confident, change talk would have been expected to show a difference.</p> <p>Secondary hypothesis was supported – a greater level of depressive symptoms interacted with therapy to facilitate a greater reducing in drinking. Depression had a mediating effect on confidence. MI's relational component may be important in</p>	<p>Limitations: There were minor differences in the two studies – although evaluated as negligible.</p> <p>Only generalizable to problem drinkers with a goal of moderation – as this may be different to a goal of abstinence.</p>

		<p>disorder (E.g. marijuana, nicotine) or were regular drug users; (2) had a serious psychiatric disorder or suicide or violence risk; (3) clinically severe alcoholism, with a history of serious withdrawal symptoms; (4) were legally mandated to substance abuse treatment; (5) reported social instability (e.g., homeless); (6) expressed a desire at baseline to achieve abstinence; or (7) expressed a desire or intent to obtain additional substance abuse treatment during the 8 week treatment period</p>	<p>Alcohol Use Disorder Identification Test (AUDIT);</p> <p>Beck Depression Inventory;</p> <p>Situational Confidence Questionnaire (self efficacy).</p> <p>Daily commitment and confidence to resist heavy drinking (online survey).</p> <p>Follow up: Secondary analysis so no follow up</p>		<p>increasing self efficacy – reducing drinking in individuals with more than mild depressive symptoms.</p>	
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Author	Aim/Method/Design	Participants	Intervention/measurements/follow up	Data analysis	Results/Findings	Limitations/Notes
Palm et al. 2016 Sweden	<p>Aim: To analyse risk and binge drinking at 12-month follow-up in young women with risk drinking behaviour who received motivational interviewing compared with controls.</p> <p>Method: Quantitative</p> <p>Design: Randomised, parallel controlled intervention study. Conducted in four youth health centres in Sweden.</p> <p>Power analysis based on an assumption that 30% of women would report risk drinking and that 10% of women receiving MI would stop risk drinking.</p> <p>Needed 500 participants to achieve 80% power.</p>	<p>Alcohol misuse in young women, aged 15-22 years during the year 2012.</p> <p>Exclusion: Severe mental illness and non-attendance at regular school because of learning difficulties.</p> <p>1051 women consented to the study (out of 1445). There were 86 men but due to the low numbers these were excluded.</p> <p>Randomised using a random allocation sequence, stratified by health centre. Used sealed envelopes.</p>	<p>Intervention:</p> <p>Control Group – normal care</p> <p>Intervention group: Health dialogue with a midwife/social worker who asked questions about alcohol consumption using AUDIT-C.</p> <p>Practitioners received 30 hours of training in MI and feedback from supervisors on 1-2 of their audiotaped MI sessions.</p> <p>Measurements: Alcohol Use Disorders Identification test consumption</p> <p>Follow up: rate at 12 months was 54%.</p>	<p>Descriptive statistics.</p> <p>Categorical outcomes analysed using chi-square test and continuous outcomes using independent <i>t</i> test.</p> <p>Differences between the two groups were analysed using paired <i>t</i> tests.</p>	<p>Results:</p> <p>Concluded that risk drinking is not static in the 15 -22 age group.</p> <p>In this study MI did not reduce alcohol drinking in young women with high-risk behaviour.</p> <p>Both groups showed a significant decrease in binge drinking from baseline at 12 months.</p> <p>Reduction of 30% high risk drinking in intervention group but 41% in the control group.</p> <p>Of the participants who did not report risk drinking at baseline 22% in the intervention group and 20% in the control group developed risk drinking at 12-month follow-up.</p>	<p>It is a limitation that only 73% of eligible women agreed to participate – this may have been a recruitment bias as no data is available for the women who refused.</p> <p>Relatively high level of attrition may also be due to selection bias. However, the attrition levels were similar between the two groups.</p> <p>Results may not be generalizable across Sweden as the level of secondary education and the number of foreign background participants was dissimilar to Sweden as a whole.</p>

Author	Aim/Method/Design	Participants	Intervention/measurements/follow up	Data analysis	Results/Findings	Limitations/Notes
Pande et al. 2015 USA	<p>Aim: Study hypothesized that successful engagement with a behavioural intervention would lead to improved use of health resources (reduced access) and lower health care costs</p> <p>Method: Quantitative</p> <p>Design: Retrospective observational study design that compared individuals who completed 7 weeks of an 8 week program with those that completed 2 weeks or less.</p> <p>Programme was delivered by telephone or secure video by a Licensed Clinical Social Worker (LCSW) and behavioural coach.</p>	<p>552 participants. Study compared outcomes for participants who completed 7 weeks or more (n 251) with those that completed 2 weeks or less (n. 241).</p> <p>Inclusion criteria: 1. Were referred to the Cardiac Health program following a recent cardiovascular event; 2. Completed an initial consultation with a therapist; 3. Were enrolled with the care provider, Aetna, for 6 months before and after the intervention.</p>	<p>Intervention: An 8-week behavioural health intervention delivered by a licensed clinical social worker and a behavioural coach via phone or secure video included CBT, Acceptance and Commitment Therapy (ACT) mindfulness and MI.</p> <p>Measurements: Depression Anxiety Stress Scale 21 (DASS-21)</p> <p>Follow up: At 6 months pre and post intake criteria there were 80% (n=201) of participants in the intervention group and 75% (n=180) in the comparison group.</p>	<p>Descriptive analyses of baseline differences used <i>t</i> tests for continuous variables and Chi squared for categorical variables. Multivariable logistic regression was used for binary outcomes. Poisson or negative binomial multivariable regression was used for count data.</p>	<p>Results: Average age 56 years, similar portion of M:F and prevalence of comorbid clinical conditions in both groups. Participants in the intervention group had a significant reduction on severity of all components of the DASS-21 score.</p> <p>Intervention group had 38% fewer total admissions and 31% fewer hospital admissions which was statistically significant. A similar proportion in each group were hospitalized in the 6 month period but more individuals in the comparison group had multiple admissions.</p> <p>Intervention group had 63% fewer total inpatient hospital days.</p> <p>Findings: The intervention which includes MI did result in statistically significant outcomes for the</p>	<p>The study included a range of behavioural interventions so it is difficult to extrapolate the significance of MI as this was combined with CBT, ACT and mindfulness.</p>

					intervention group who experienced a reduction in all components of the DASS 21 and experienced fewer hospital and ED admissions/OPD visits.	
Author	Aim/Method/Design	Participants	Intervention/measurements/follow up	Data analysis	Results/Findings	Limitations/Notes
Russell et al. 2011 USA	<p>Aim: To examine the feasibility and efficacy of a staff delivered motivational interviewing technique on treatment, diet medication and fluid adherence in adult patients receiving outpatient hemodialysis</p> <p>Method: Quantitative</p> <p>Design: Using a pre-test, post-test design pilot study</p>	<p>Convenience sample of 29 adult hemodialysis patients were recruited from a Midwestern non-profit, free-standing clinic.</p> <p>Inclusion criteria: 1. Age 21 or over; 2. Able to understand and communicate in English; 3. No cognitive impairment, determined by a score of 24 or above on the mini mental status exam; 4. Well enough to participate as determined by dialysis nurse manager.</p>	<p>Intervention: baseline data was collected for three months.</p> <p>Participants then received a 3-month, staff-delivered MI intervention during regular dialysis treatment. All staff (nurses, technicians, dietician, social worker) were trained on the use of MI by an expert. Staff had monthly coaching sessions during three months prior to MI. All staff observed MI interactions and assessed competence. A development plan was devised by the expert and reviewed with each staff member</p> <p>Post intervention adherence data was</p>	<p>Descriptive statistics for continuous and categorical variables.</p> <p>Wilcoxon signed rank test use to compare pre and post intervention adherence data</p>	<p>Results: Demographic characteristics similar to patients receiving dialysis in USA. MI favourably influenced dialysis attendance, phosphorous and albumin levels, but findings were not statistically significant. MI less favourably change in IDWG. Changes in HCCG scores were not statistically significant although the trend suggested improvement in autonomy support</p> <p>The MI intervention influenced dialysis attendance, shortened treatments, phosphorous and albumin levels favourably with less impact on Interdialytic</p>	<p>Using staff in the study could be a limitation as their competence levels were likely to vary.</p> <p>The study design limits the ability to determine causality; a lack of power limits the ability to detect a difference.</p> <p>Use of a single centre limits generalizability.</p> <p>There may be selection bias in that those who agreed to participate may have been different to those who didn't.</p> <p>Possibility of the Hawthorne effect – participants may have spontaneously altered their behaviour to please the researchers.</p>

			<p>collected for three months (treatment, fluid, medication, diet) were extracted from medical records. MI continued during this period –total of 6 months.</p> <p>Measurements: Mini mental status exam; Interdialytic Weight Gain (IDWG); Serum phosphorous; Serum albumin</p> <p>National Kidney Foundation dialysis Outcome and Quality Initiative outcome parameters; Health Care Climate Questionnaire</p> <p>Follow up: 3 months, 66% (n = 19) completed the study</p>		<p>Weight Gain (IDWG). Dialysis staff effectively delivered the MI intervention. Participants' perceptions of the MI intervention were highly favourable.</p>	
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Author	Aim/Method/Design	Participants	Intervention/measurements/follow up	Data analysis	Results/Findings	Limitations/Notes
Slesnick et al. 2013. USA	<p>Aim: To test the impact of three substance abuse treatment interventions on internalizing and externalizing behaviours.</p> <p>Hypothesis 1) Internalizing and externalizing problems would be reduced in all treatments and 2) adolescents who received family therapy would maintain their reductions for a longer period of time compared with CRA and MI</p> <p>Method: Quantitative</p> <p>Design: Randomised trial</p> <p>Method of randomisation not stated</p>	<p>179 substance abusing runaway adolescents recruited from a short-term runaway shelter in a large mid western city.</p> <p>Inclusion: Aged between 12 – 17 years, had the legal option of returning home and had at least one parent/carer willing to participate in the study.</p>	<p>Intervention: Comparison of 3 psychotherapy interventions, Motivational Interviewing (MI), the Community Reinforcement Approach (CRA), and Ecologically-Based Family Therapy (EBFT).</p> <p>The researchers were trained over 2 days, received weekly supervision and audiotape review.</p> <p>Measurements: Computerised Diagnostic Interview Schedule for Children (CDISC)</p> <p>(YSR) Child Behaviour Checklist (112 item scale) administered to the children</p> <p>Parents were administered the Child Behaviour Checklist</p> <p>Follow up: At 2 years was 77% (n=41) in the</p>	<p>Descriptive analyses using <i>t</i> test and ANOVA</p> <p>Paired <i>t</i> tests were used to compare differences between CBCL and YSR.</p>	<p>Results: All three treatments were associated with a significant reduction in internalizing and externalizing behaviours at 2 years. MI produced a faster rate of change compared to family systems therapy, but adolescents receiving family systems therapy continued to show reductions in mental health problems at 24 months while adolescents in MI and CRA showed some increase in internalizing and externalizing by 24 months. Concluded that all three interventions showed clinical improvement in symptoms over the two year period.</p> <p>Outcomes were measured longitudinally over a two-year period to measure internalizing and externalizing behaviour scores.</p>	<p>Convenience sample so not generalizable to the general population.</p> <p>The adolescents and families who participated in the study may have been more motivated to change than those who refused.</p>

			EBFT group; 68% (n=38) in the CRA group and 82% (n=46) in the MI group			
Author	Aim/Method/Design	Participants	Intervention/measurements/follow up	Data analysis	Results/Findings	Limitations/Notes
Smith et al. 2012 USA	<p>Aim: Hypothesis: 1. That MI will not influence adherence to structural exercise sessions</p> <p>2. That individuals with MS randomised to an MI intervention will report a better exercise experience marked by better affect during exercise, lower mental and physical fatigue and lower perceived exertion when exercising.</p> <p>Method: Quantitative</p> <p>Design: Randomised Controlled Trial</p>	<p>Individuals with advanced MS –13 were randomised, 7 to intervention, 6 to control.</p> <p>Inclusion criteria: 1. definite diagnosis of MS; 2. were relapse free in the previous 30 days; 3. had impaired mobility; 4. described themselves as not engaging in regular activity of 30 minutes or more on two or more days a week</p>	<p>Intervention: Three 30-60 minute sessions of MI;</p> <p>Control: was three 30-60 minutes of health coaching</p> <p>Participation in an 8-week exercise programme.</p> <p>MI was administered by a masters' level social worker who received 40 hours of training and weekly supervision.</p> <p>Measurements: 4 self-report measures – The Feeling Scale; Rating of Perceived Exertion Scale; Enjoyment Scale; Mental and Physical Fatigue Scale were completed at the end of each exercise session.</p> <p>Follow up: No loss of participants to follow up. One of the</p>	<p>Analysis of mean score and standard deviation using SPSS. Inferential analysis independent sample t tests on dependent measures. Analysis were replicated using nonparametric tests after removing outliers</p>	<p>Results: Interrater reliability was high. The social worker approached or exceeded published standards for competence in intervention group but not in the control group.</p> <p>There was no difference in attendance of the sessions (MI v coaching) between each group, however MI participant sessions were significantly longer than control group sessions.</p> <p>Of 6 main outcomes, 5 appeared to favour MI, but only 3 were statistically significant. These were perceived exertion, affect and physical fatigue. MI group reported less exertion, and physical fatigue and more positive effect.</p>	<p>Major limitation: small sample size. Need longitudinal studies to assess whether adherence is better at 3, 6 or 12 months.</p> <p>All participants experienced MI or a coaching conversation for the control group administered by one social worker increasing consistency of approach.</p>

			intervention group did not complete the MI intervention.		<p>No difference in exercise adherence or mental fatigue</p> <p>MI group reported lower mental fatigue and higher enjoyment although this was not statistically significant.</p> <p>This small RCT concluded that individuals with MS who experience an MI intervention report a better exercise experience reporting less exertion and physical fatigue with exercise and a more positive effect. Whilst the small sample in the intervention group reported lower mental fatigue and higher enjoyment with exercise, these findings were not statistically significant.</p> <p>Conclude that using MI can result in improved exercise experience for people with MS.</p>	
Author	Aim/Method/Design	Participants	Intervention/measurements/follow up	Data analysis	Results/Findings	Limitations/Notes

<p>Tibber et al. 2015</p> <p>UK</p>	<p>Aim: Purpose of the intervention was to increase patients' motivation to change their patterns of substance misuse.</p> <p>Method: Quantitative</p> <p>Design: Quasi-experimental study pre/post test design without a control group.</p>	<p>Convenience sample of male patients detained under MH Act aged between 19-56 years.</p> <p>Risk factors – Patients with a history of substance (or polysubstance) misuse who also had a diagnosed MH disorder.</p> <p>Excluded if they had a history of violence or had absconded from the ward two weeks before their assessment. Also if they did not have the intellectual capacity to participate in the groups.</p> <p>Location: inpatients in a forensic service from secure wards</p>	<p>Intervention: Dual diagnosis intervention with 2 stages.</p> <p>Stage 1: 10 week psycho-education programme aimed to increase understanding of substance misuse, mental/physical health and offending behaviour using MI.</p> <p>Stage 2: 16 week programme, CBT skills to help change patterns of behaviour of substance misuse.</p> <p>Stage 3: 6-8 week programme – one to one sessions preparing for transition to community care</p> <p>Stages 1-2 in small groups of 6-8 men</p> <p>Measurements: Stage 1: 10 week psycho-educational programme – self reported questionnaires: Alcohol and other drugs knowledge questionnaire (KNOW)</p> <p>Stage 2: Stage of change and treatment</p>	<p>Parametric statistics using <i>t</i> tests and multivariate analyses of variance (MANOVAs). Change ruler analyses using Wilcoxon Signed Rank tests.</p>	<p>Results: TMQ: No shift in stage 1 scores. Stage 2 significant effect of time point. Post hoc <i>t</i> test showed that the only significant shift was service users external motivation for treatment.</p> <p>ECBI: Self reported effectiveness of coping behaviours revealed no effect of time or difference at pre and post stage 2 scores.</p> <p>Findings: Stage 1 knowledge increased as a result of the intervention. However, this was not sufficient to induce a shift in attitudes.</p> <p>Stage 2: readiness to change did not shift during group participation. Main effect was an increase in external motivation for treatment. Concluded that this may reflect a more realistic evaluation of the challenges facing them.</p>	<p>Stage 3 not included so further studies should assess the efficacy of stage 3 as this is where MI would have its greatest effect.</p>
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			<p>eagerness scale v5 (SOCRATES); Three change rulers; Treatment motivation questionnaire (TMQ); Effectiveness of coping behaviors inventory (ECBI)</p> <p>Follow up: Stage 1: 147 available service users; 54% (n=80) completed pre and post data sets, drop-out rate of 46%</p> <p>Stage 2: 53 available service users but only 71% (n=37) completed pre and post data sets – drop-out rate of 29%</p> <p>Stage 3: Not reported in this paper</p>			
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Author	Aim/Method/Design	Participants	Intervention/measurements/follow up	Data analysis	Results/Findings	Limitations/Notes
Vos et al. 2011 The Netherlands	<p>Aim: To evaluate the effect of a family based behavioural lifestyle intervention on markers of obesity, metabolism, inflammatory markers and physical fitness compared with standard care in this group.</p> <p>Method: Quantitative</p> <p>Design: Longitudinal, prospective, randomised clinical trial</p>	<p>Obese children (as defined by Cole, 2000) aged 8 – 17 years who were referred to a paediatrician. Stratified by age (8- under 12 and 12 to under 17), gender and ethnicity.</p> <p>Exclusion criteria: insufficient Dutch language, intelligence of social skills (not defined); medication that may effect weight loss, medical co-morbidity.</p> <p>41 children were randomised to the intervention and 40 to the control group</p> <p>Paediatric clinic within a Children's Hospital</p>	<p>Intervention: Individual counselling of the child with parents.</p> <p>Intensive phase of group sessions over three months (7 meetings with the children (2.5 hours long, fortnightly); 5 with the parents, 1 meeting with parents and children. A 2 year follow up session - 2-3 times a year – was offered for 2 years in total.</p> <p>Control Group: received standard care and advice at the start of the trial on how to increase physical activity.</p> <p>Measurements: Weight, BMI, Waist circumference and blood pressure.</p> <p>Voluntary maximal exercise test to assess physical fitness.</p> <p>Biochemical blood tests: Glucose, plasma insulin, insulin resistance, HDL</p>	<p>Descriptive statistics expressed as means and standard deviation. ANOVA for comparison with intervention group.</p> <p>Pearson correlation analysis for baseline study parameters.</p>	<p>Results: Adiposity significantly reduced in the intervention group at 3 months and 1 year. BMI reduced by 10% and WC by 19%</p> <p>Blood pressure decreased in intervention group, no change in control. Physical fitness significantly improved in intervention group.</p> <p>No change in fasting insulin and lipid profile.</p> <p>Findings: That a multidisciplinary lifestyle intervention demonstrated beneficial results in reducing body weight, improving fitness levels , nutritional habits and coping strategies (although after 2 years the children did not manage to reduce their body weight to a normal range).</p> <p>Whilst parents were involved in this study, an issue was their unrealistic expectations</p>	<p>Participants were referred to the study so may have been subject to selection and referral bias – therefore the children may not be representative of severely obese children in the general population.</p> <p>Method of randomisation was not stated.</p>

			<p>cholesterol Triglyceride CRP, Adiponectin level</p> <p>Follow up:</p> <p>3 months: I – 88% (n=36); C – 82% (n=33)</p> <p>1 year: I - 78% (n=32); C – 87% (n=35)</p> <p>2 years: I – 76% (n=31)</p> <p>The control group did not continue into year 2 as they were offered the intervention at this time.</p> <p>Normative data for physical fitness and metabolic processes was collected from a group of 34 healthy children with a normal body weight, matched for age, gender and ethnicity.</p>		<p>of weight loss.</p> <p>Therefore it is important to maintain motivation with parents and children after the initial interview to encourage maintenance of the newly learned lifestyle.</p>	
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Table 2. Characteristics of excluded studies

Author & country of origin	Method & Intervention	Participants	Reason(s) for exclusion
Bohman et al., 2011 USA	Method: Quantitative RCT Intervention: The Working Well case management intervention involved health navigation, employment/vocational supports, expedited appointments, free medications, and no co-pays for medical visits.	Uninsured working adults with chronic mental, behavioural and physical health conditions	This study was excluded as it didn't focus on MI and it didn't provide sufficient detail information in response to our research question.
Chovanec, 2012 USA	Method: Mixed research method Intervention: Domestic abuse group programme	Male domestic abusers	This study was excluded as it didn't focus on MI and it didn't provide sufficient detail information in response to our research question.
Fischer et al., 2014 USA	Method: Quantitative – Cohort study Intervention: Training as usual (MIU), and training emphasizing the evocation and reinforcement of change talk (MI+).	Participants were 190 substance use clinicians randomized to MIU or MI+ training workshops	This paper was excluded as it is about clinicians' behaviour and not service users or social workers. Note: Data was used from another project ELICIT which was an RCT. Project ELICIT is a randomized clinical trial comparing two approaches to training in MI.
McKenna et al., 2013 USA	Method: Quantitative, Protocol Intervention: Screening, Brief Intervention, and Referral to Treatment (SBIRT)	Adolescents using drugs	This study was a protocol only and not a research study, therefore didn't provide sufficient information on effectiveness of MI.
Nedjat-Haiem et al, 2017 Mexico	Method: Quantitative Intervention: Intervention: ACP, Emotional support and systems navigation to access resources; involved MI methods	74 patients enrolled: 39 to usual care, 35 to intervention group	This study was excluded as it didn't focus enough on MI and it didn't provide sufficient detail information in response to our research question.

Author & country of origin	Methods & Intervention	Participants	Reason for exclusion
Thomas et al., 2011 USA	Method: Quantitative, RCT Intervention: Evaluation of Working Well study	Uninsured, working adults with chronic mental, behavioural and physical health conditions	This study was excluded as it didn't focus on MI and it didn't provide sufficient detail information in response to our research question.
Willis, 2011 USA	Method: Quantitative, Protocol Intervention: Drinking behaviour of trauma victims AUDIT-C Alcohol use disorders identification test – consumption and CAGE alcohol questionnaire assessment	Trauma victims	This study was excluded as it was a protocol only and it didn't focus on MI and it didn't provide sufficient detail information in response to our research question.